Chapter Five

5.1 Federal Statutes and Policies

In compliance with NEPA, this Final EIS is intended to provide decision makers and the public with information regarding compliance with other environmental laws, rules, and regulations that are applicable to the proposed federal action as well as the environmental impacts of the proposed federal action, as presented below.

5.1.1 Endangered Species Act of 1973, as Amended (16 U.S.C. Sections (§§) 1531-1544)

Section 7 of the ESA requires federal agencies to consult with FWS to ensure that undertaking, funding, permitting, or authorizing an action is not likely to jeopardize the continued existence of listed species or destroy or adversely modify designated critical habitat, as defined under the law.

Adoption of the proposed federal action by the Secretary is a discretionary federal action and it is, therefore, subject to compliance with ESA. Reclamation has prepared a biological assessment to address the potential effects of the proposed federal action on listed species and has initiated formal consultation with FWS (Appendix R). It is anticipated that consultation will be completed prior to Reclamation's execution of a Record of Decision.

5.1.2 Fish and Wildlife Coordination Act of 1934, as Amended (16 U.S.C. §§ 661-667d)

The Fish and Wildlife Coordination Act of 1934, as amended, requires consultation and coordination with federal and state wildlife agencies to ensure that fish and wildlife are given equal consideration when developing water resources projects. This Act applies "whenever the waters of any stream or other body of water are proposed or authorized to be impounded, diverted, the channel deepened, or the stream or other body of water otherwise controlled or modified…" and requires that the responsible federal agency "shall consult with the United States Fish and Wildlife Service, Department of the Interior, and with the head of the agency exercising administration over the wildlife resources of the particular State wherein the impoundment, diversion, or other control facility is to be constructed". The proposed federal action is not a construction project. Nevertheless, FWS is a cooperating agency and has been involved in the preparation of the Draft EIS and the Final EIS. In addition, FWS reviewed and provided comments on the Draft EIS and the Final EIS. The close coordination with FWS on this project meets the intent and provisions of the Fish and Wildlife Coordination Act.

5.1.3 National Wildlife Refuge System Administration Act of 1966 (16 U.S.C. § 668dd)

The National Wildlife Refuge System Administration Act of 1966 provides for the administration and management of the national wildlife refuge system, including wildlife refuges, areas for the protection and conservation of fish and wildlife threatened with extinction, wildlife ranges, game ranges, wildlife management areas and waterfowl production areas. The study area includes the following four national wildlife refuges on the Colorado River downstream of Hoover Dam: Havasu NWR, Bill Williams NWR, Cibola NWR, and Imperial NWR. Only minor changes in Colorado River flow through these

refuges would occur under the action alternatives. No adverse impacts to refuges would result from the proposed federal action; thus, it would be consistent with the National Wildlife Refuge System Administration Act.

5.1.4 Wild and Scenic Rivers Act of 1968 (16 U.S.C. §§ 1271-1287)

The Wild and Scenic Rivers Act of 1968 establishes a National Wild and Scenic Rivers System for the protection of rivers with important scenic, recreational, fish and wildlife, and other values. Rivers are classified as wild, scenic or recreational. The Congressional policy behind the National Wild and Scenic Rivers System is not to halt use of a river; instead, the goal is to preserve the character of a river. Uses compatible with the management goals of a particular river are allowed; however, development must ensure the river's free flow and protect its "outstandingly remarkable resources." The Wild and Scenic Rivers Act of 1968 designates specific rivers for inclusion in the National Wild and Scenic Rivers System and prescribes the methods and standards by which additional rivers may be added. There are no designated wild and scenic rivers within the study area.

However, pursuant to Section 5(d) of the Wild and Scenic Rivers Act, NPS has compiled and maintains a Nationwide Rivers Inventory (NRI), a register of river segments that potentially qualify as national wild, scenic, or recreational river areas. The NRI is a listing of more than 3,400 free-flowing river segments in the United States that are believed to possess one or more "outstandingly remarkable" natural or cultural values judged to be of more than local or regional significance. Under a 1979 Presidential directive, and related Council on Environmental Quality procedures, all federal agencies must seek to avoid or mitigate actions that would adversely affect one or more NRI segments. Within the study area, NPS has identified four river segments (with segment lengths provided in parentheses) on the NRI:

- Colorado River from Paria Riffle (RM 1) to 237-Mile Rapid in Grand Canyon National Park (236 miles);
- Colorado River from Glen Canyon Dam to Lake Mead (278 miles);
- Colorado River from upper end of Lake Havasu (Blankenship Bend) to Interstate Highway 40 bridge crossing in Topock (11 miles); and
- Colorado River from gaging station below Cibola Lake to Martinez Lake (Fishers Landing) (31 miles).

The relatively minor changes in flow associated with the proposed federal action would not adversely affect the values for which these Colorado River segments were identified.

5.1.5 Migratory Bird Treaty Act of 1918 (16 U.S.C. §§ 703-712)

The Migratory Bird Treaty Act of 1918 protects migratory birds by limiting the hunting, capturing, selling, purchasing, transporting, importing, exporting, killing, or possession of these birds or their nests or eggs. The specific migratory birds covered are identified in separate agreements between the United States and Great Britain, Mexico, and Japan. No significant adverse impacts to migratory birds would result from the proposed federal action; thus, it would be consistent with the Migratory Bird Treaty Act.

5.1.6 Migratory Bird Conservation Act of 1929 (16 U.S.C. § 715)

The Migratory Bird Conservation Act of 1929 protects migratory birds by creating the Migratory Bird Conservation Commission. This commission's purpose is to consider and approve the purchase, rental, or other acquisition of any areas of land or water that may be recommended by the Secretary for the purpose of establishing sanctuaries for migratory birds. No significant adverse impacts on migratory birds would result from the proposed federal action; thus, it would be consistent with the Migratory Bird Conservation Act.

5.1.7 Bald Eagle Protection Act of 1940 (16 U.S.C. § 668)

The Bald Eagle Protection Act of 1940 imposes criminal and civil penalties on anyone in the United States or within its jurisdiction who, unless excepted, takes, possesses, sells, purchases, barters, offers to sell or purchase or barter, transports, exports or imports at any time or in any manner a bald or golden eagle, alive or dead; or any part, nest or egg of these eagles; or violates any permit or regulations issued under the Bald Eagle Protection Act. No adverse impacts to bald eagles would result from the proposed federal action; thus, it would be consistent with the Bald Eagle Protection Act.

5.1.8 Clean Air Act of 1963, as Amended (42 U.S.C. § 7506)

The primary objective of the Clean Air Act of 1963, as amended, is to establish federal standards for air pollutants from stationary and mobile sources and to work with the states to regulate polluting emissions. The Clean Air Act is designed to improve air quality in areas of the country that do not meet federal standards and to prevent significant deterioration in areas where air quality exceeds those standards. The proposed federal action would not result in any emissions from stationary or mobile sources or violate air quality standards. Therefore the proposed federal action is consistent with the Clean Air Act.

5.1.9 Federal Water Pollution Control Act (Clean Water Act) of 1972, as Amended (33 U.S.C. Chapter 26)

Section 404 of the Clean Water Act of 1972, as amended, identifies conditions under which a permit is required for construction projects that result in the discharge of fill or dredged materials into waters of the United States. Section 402 of the Clean Water Act requires a permit for the discharge of pollutants into waters of the United States. No construction activities are associated with implementation of the proposed federal action. Therefore, it is consistent with the Clean Water Act.

5.1.10 River and Harbors Act of 1899 (33 U.S.C. §§ 401-403)

The River and Harbors Act of 1899 protects the public’s right to free navigation in navigable waters of the United States as described by the USACE Section 10/404 implementing regulations at 33 C.F.R. pt. 329. The River and Harbors Act also prohibits unauthorized construction in navigable waters of the United States. No construction activities are associated with implementation of the proposed federal action. Therefore, it is consistent with the River and Harbors Act.

5.1.11 National Historic Preservation Act of 1966, as Amended (16 U.S.C. § 470)

Federally funded undertakings that have the potential to impact historic properties are subject to Section 106 of the NHPA and its implementing regulations under 36 C.F.R. pt. 800. Under the National Historic Preservation Act of 1966, as amended, federal agencies are responsible for the identification, management, and nomination to the NRHP of cultural resources; if a proposed undertaking would affect historic properties, the agency must afford the Advisory Council on Historic Preservation the opportunity to comment. Reclamation's compliance with the National Historic Preservation Act, as amended, is described in Section 4.9.

5.1.12 Native American Graves Protection and Repatriation Act of 1990 (25 U.S.C. §§ 3001-3013)

Native American Graves Protection and Repatriation Act of 1990 assigns ownership to Indians of human burials and associated grave goods, which are excavated or discovered on federal or Tribal lands. Implementation of the proposed federal action has no potential to disturb Indian human remains or associated funerary objects; however, Reclamation and the other Department agencies with compliance responsibilities under this Act or its implementing regulations are committed to compliance with the inadvertent discovery process in pertinent laws and regulations.

5.1.13 Archaeological Resources Protection Act of 1979 (16 U.S.C. § 470)

The Archaeological Resources Protection Act (ARPA) of 1979 provides for the protection of archaeological resources on public and Indian lands. Protection of archaeological resources, under the guidelines of ARPA, includes consideration of excavation and removal of resources, enforcement of ARPA, and confidentiality of information concerning the nature and location of archaeological resources. It also provides substantial criminal and civil penalties for those who violate the terms of ARPA. Should any data recovery be proposed as a result of cultural resources compliance and consultation, Reclamation or its contractors shall seek the appropriate ARPA permits.

5.1.14 Farmland Protection Policy Act of 1981 (7 U.S.C. §§ 4201-4209)

The purpose of the Farmland Protection Policy Act of 1981 is to minimize the extent to which federal programs contribute to the unnecessary conversion of farmland to nonagricultural uses. The proposed federal action will not permanently convert any farmland, prime or otherwise. The Farmland Protection Policy Act also stipulates that federal programs be compatible with state, local, and private efforts to protect farmland. While there is a potential for increased temporary land following during droughts under some of the action alternatives, the proposed federal action would not likely result in the conversion of farmland to nonagricultural uses. Any impact from the storage and delivery mechanism would not result in the permanent conversion of any prime farmland. Therefore, the proposed federal action is consistent with the Farmland Protection Policy Act.

5.1.15 Executive Order No. 11988, Floodplain Management, May 24, 1977

This executive order requires avoiding or minimizing harm associated with the occupancy or modification of a floodplain. The proposed federal action would not involve modifications or occupancy of any floodplain, therefore the proposed federal action is consistent with Exec. Order No. 11988.

5.1.16 Executive Order No. 11990, Protection of Wetlands, May 24, 1977

This executive order provides for protection of wetlands through avoidance or minimization of adverse impacts. The proposed federal action would not involve modifications of or construction within jurisdictional wetlands, therefore, the proposed federal action is consistent with Exec. Order No. 11990. Minor changes in river flow and its potential effect on backwaters and marsh habitat is discussed in Section 4.8.

5.1.17 Executive Order No. 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, February 11, 1994

This executive order directs agencies to identify and address, as appropriate, disproportionately high and adverse human health and environmental impacts of their programs, policies, and activities on minority and low-income populations. An analysis of the effects of the proposed federal action on minority and low-income populations is included in Section 4.15 of this Final EIS. No significant disproportionate impacts on minority or low income populations were identified.

5.1.18 Executive Order No. 13007, Indian Sacred Sites, May 24, 1996

This executive order requires that all Executive Branch agencies that have responsibility for the management of federal lands will, where practicable, permitted by law, and not clearly inconsistent with essential agency functions, provide access to Indian sacred sites for ceremonial use by Indian religious practitioners, and will avoid adversely impacting the integrity of these sites. When possible, federal agencies must also maintain the confidentiality of sacred sites. Implementation of the proposed federal action would not conflict with the requirements of Exec. Order No. 13007.

5.1.19 Executive Order No. 12114, Environmental Impacts Abroad of Major Federal Actions, January 4, 1979

The 1944 Treaty between the United States and Mexico (including its implementing Minutes) establishes the obligations of the United States regarding the delivery of Colorado River water to Mexico. In addition, Section 397 of Public Law 109-432 states: "The Treaty between the United States of America and Mexico relating to the utilization of waters of the Colorado and Tijuana Rivers and of the Rio Grande, and supplementary protocol signed November 14, 1944, signed at Washington February 3, 1944 (59 Stat. 1219) is the exclusive authority for identifying, considering, analyzing, or addressing impacts occurring outside the boundary of the United States of works constructed, acquired, or used within the territorial limits of the United States."

Exec. Order No. 12114 provides among other things that: (1) federal agencies involved in actions with potential significant environmental impacts outside of the United States must provide information to federal decision makers so that the potential effects may be analyzed with other pertinent considerations of national policy; (2) activities involving foreign governments be coordinated through the Department of State; and (3) pertinent information may be withheld from other agencies and nations when necessary to avoid adverse impacts to foreign relations and ensure appropriate reflection of diplomatic factors. Section 1 of Exec. Order No. 12114 provides that it is the United States' "exclusive and complete determination of the procedural and other actions to be taken by the federal agencies to

further the purpose of the National Environmental Policy Act, with respect to the environment outside the United States, its territories and possessions."

Reclamation has complied with Exec. Order No. 12114 and Public Law 109-432 by informing the Department of State of the proposed federal action and by providing technical support to the USIBWC for its consultation with Mexico. This Final EIS incorporates appropriate information regarding potential hydrologic and water quality impacts to Mexico at the border with Mexico that have been prepared after coordination with the USIBWC, as well as with representatives of the Department of State.

5.1.20 Secretarial Order No. 3206, American Indian Tribal Rights, Federal-Tribal Trust Responsibility, and the Endangered Species Act, June 7, 1997

This Secretarial Order directs that the Department and it's sub-bureaus carry out their responsibilities under ESA in a manner "that harmonizes the Federal trust responsibility to tribes, tribal sovereignty, and statutory missions of the Departments, and that strives to ensure that Indian tribes do not bear a disproportionate burden for the conservation of listed species, so as to avoid or minimize the potential for conflict and confrontation." Implementation of the proposed federal action will be undertaken consistent with the requirements of this Secretarial Order.

5.2 Cumulative Impacts

The CEQ's regulations (40 C.F.R. pt. 1500 through 1508) implementing the procedural provisions of NEPA defines cumulative impacts as the following:

> "…the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time (40 C.F.R. pt. 1508.7)."

Cumulative impacts refer to two or more individual impacts that, when considered together, are significant or that compound or increase other environmental impacts. Cumulative impacts can be categorized as additive and interactive. An additive impact results from additions from one kind of source either through time or space. An interactive impact results from more than one kind of source.

Generally, other actions that could result in cumulative impacts when considered in tandem with the effects of the proposed federal action (as identified in Chapter 4) have been incorporated into modeling of future system conditions. Such actions include future increases in consumptive use of Colorado River water in the Upper Division states, intrastate water transfers in the Lower Division states (e.g., QSA water transfers), implementation of the LCR MSCP, and various requirements and constraints applied to the operation of the Colorado River system.

This section addresses the cumulative impacts of the proposed federal action combined with other regional water supply or closely related projects in the region. Closely related projects that could result in significant cumulative impacts are briefly described below.

5.2.1 SNWA Clark, Lincoln, and White Pine Counties Groundwater Development Project

This project includes groundwater production, conveyance and treatment facilities, and power conveyance facilities located in central and eastern Nevada. The project as proposed would develop and convey up to 167 kafy of groundwater from Clark, Lincoln, and White Pine Counties to the Las Vegas Valley for use in the SNWA service area to supplement the SNWA water supplies. This project will assist SNWA in meeting southern Nevada's projected future water demands and increase the diversification of SNWA's current water resources to include non-Colorado River groundwater resources.

SNWA applied to BLM for the Rights of Way for the pipelines and other facilities. BLM is the lead federal agency preparing SNWA's groundwater EIS to analyze the environmental issues associated with SNWA's request for Rights of Way. It is not currently anticipated that this project will be completed prior to 2014. Water from this project will be fully consumptively used in southern Nevada.

5.2.2 SNWA Lake Mead Intake No. 3 Project

SNWA presently operates two water intakes at Saddle Island on the west shore of Lake Mead, approximately five miles northwest of Hoover Dam and approximately 20 miles east of the center of Las Vegas, within the LMNRA. Drought has caused declining Lake Mead elevations during recent years. Long-term water supply modeling indicates that the lake elevation is expected to decline even further in future years, even under normal hydrologic conditions in the Colorado River Basin, until the system recovers from the recent drought conditions.

SNWA proposes to construct a third deep-water intake, Intake No. 3, in Lake Mead, and other associated project components to protect the existing water system capacity against the potential loss of pumping capability of Intake No. 1 should the lake elevations fall below 1,050 feet msl. An EA is being prepared by NPS, lead federal agency, to grant SNWA's application for an expansion of an existing Right of Way associated with the construction of the proposed Intake No. 3 facilities. The major project components would include a new intake structure and intake tunnel beneath the lake and beneath Saddle Island; Intake Pumping Station No. 3 (IPS-3) on Saddle Island, the caverns or forebays beneath Saddle Island and shafts around IPS-3 for construction and connections; a conveyance pipeline from IPS-3 connecting with Alfred Merritt Smith Water Treatment Facility; and a tunnel interconnecting the Intake No. 3 tunnel with the existing Intake No. 2 tunnel beneath Saddle Island.

The Intake No. 3 project would:

- preserve water delivery system capacity;
- provide reliable water delivery system back-up capability; and

- provide operational flexibility for accessing the best available water quality for the public water supply.

The construction of the Intake No. 3 would allow SNWA to maintain full system capacity at Lake Mead elevations as low as 1,000 feet msl. The Intake No. 3 project does not propose any change or increase in the quantity of Colorado River water authorized for diversion and use by the SNWA. The project is a modification of the location from which SNWA's existing contractual rights to water are withdrawn from the Colorado River at Lake Mead, giving SNWA the flexibility to take water from different elevations and locations in Lake Mead depending on seasonal lake conditions and lake elevations.

5.2.3 Systems Conveyance and Operations Program

Reclamation and NPS prepared an EIS as joint lead federal agencies to analyze the potential impacts associated with the construction, operation, and maintenance of the SCOP. The Clean Water Coalition (CWC) is comprised of the four agencies currently responsible for wastewater treatment in Las Vegas Valley: the City of Las Vegas, the City of Henderson, the Clark County Water Reclamation District, and the City of North Las Vegas. The CWC proposes to implement the SCOP, which would include optimization of the treatment plants, increased treatment (as needed), and a pipeline to discharge the highly treated effluent into Lake Mead, while minimizing impacts to water quality and other natural resources. The SCOP would provide an alternate discharge point for the effluent, which is currently discharged to Lake Mead through the Las Vegas Wash. The purpose of the project is to maintain water-quality standards and NPS's recreational and resource values by operating a system that would allow for flexible management of wastewater flow from Las Vegas Valley to Lake Mead. The quantity of effluent treated and discharged from Las Vegas Valley will increase as the population of Las Vegas Valley increases. Wastewater facilities must accommodate the additional flows while continuing to meet current or future water quality standards for the Las Vegas Wash, Las Vegas Bay, and Lake Mead.

The SCOP EIS analyzed the potential environmental impacts associated with three pipeline alternatives, a Process Improvements Alternative (no pipeline), the No Action Alternative (no pipeline); and the Boulder Islands North (pipeline) alternative, which was identified as the preferred alternative.

5.2.4 Lower Colorado River Multi-Species Conservation Program

This program was developed to address potential effects to listed and other selected special status species (covered species) from identified ongoing and future anticipated federal discretionary actions and non-federal activities on the lower Colorado River (covered actions). The development and implementation of shortage criteria on the lower Colorado River was one of the federal covered actions included in the LCR MSCP and covered under the LCR MSCP BO (FWS 2005). The LCR MSCP BO covered the effects of covered actions for a reduction of Lake Mead reservoir elevations to 950 feet msl and flow reductions of up to 0.845 maf from Hoover Dam to Davis Dam, 0.860 maf from Davis Dam to Parker Dam, and 1.574 maf from Parker Dam to Imperial Dam. The LCR MSCP identified, and it is mitigating for, impacts to the covered species and their habitats from the flow reduction conditions described above. These impacts included the potential loss of up to:

- 2,008 acres of cottonwood-willow habitats;
- 133 acres of marsh habitat; and
- 399 acres of backwater habitat.

To address these impacts, the LCR MSCP will:

- restore 5,940 acres of cottonwood-willow habitat;
- restore 512 acres of marsh habitat;
- restore 360 acres of backwater habitat;
- stock 660,000 razorback sucker over the term of the LCR MSCP; and
- stock 620,000 bonytail over the term of the LCR MSCP.

In addition, these habitats will be actively managed to provide habitat values greater than those of the impacted habitats. While the LCR MSCP is geared toward special status species, it is important to understand that all species that use the habitats impacted by the LCR MSCP covered activities benefit by the conservation actions currently being carried out under the LCR MSCP. The LCR MSCP EIS evaluated the impacts of implementing the Habitat Conservation Plan and the issuance of a Section 10(a)(1)(B) permit by FWS. The LCR MSCP documents (Reclamation 2004a-e) are incorporated by reference into this Final EIS.

5.2.5 All-American Canal Lining Project

Imperial Irrigation District obtains water from the 82-mile long AAC, which diverts water from the Colorado River at Imperial Dam. This water conservation project is proceeding according to Sections 395 and 397 of Public Law 109-432. This project includes construction of a new, parallel canal from one mile west of Pilot Knob to Drop 3, a distance of 23 miles. The centerline of the new canal would be offset from the old centerline of the original canal by a distance of 300 to 600 feet, depending on terrain, ease of construction, and location of existing structures. Operation and maintenance roads would be 20 feet wide to match existing canal roads (Reclamation 1994c,d).

Excavation of 25 million cubic yards of earth is required. Excess material will be placed in waste banks along the new canal. An estimated 530 acres of new right-of-way will be required, all of which is under federal control. Other land disturbances will include a 10-acre concrete batch plant and three, 5-acre staging areas, all of which are on previously disturbed lands. Power lines would be relocated as required. Actual construction will last approximately three years. The canal would be in service year-round, as it is at the present (Reclamation 1994c,d).

Environmental impacts were identified in the following areas: groundwater quantity and quality in Mexico, biological resources (wetlands along the canal and along the impacted reach of the Colorado River, terrestrial plant communities and associated wildlife, and special status species), canal fisheries, cultural resources, hydroelectric power, and recreation (Reclamation 1994c,d). The AAC Lining Project will employ compensation measures to reduce potential air quality impacts. A variety of mitigation measures have been incorporated into the project, including establishing 43 acres of honey mesquite and cottonwood/willow and one acre of marsh, restoring shelter for juvenile fish by constructing artificial reefs in the canal, replacing and protecting habitat for special status species and to help maintain the fishery for recreational fishing, and avoiding cultural resources sites where feasible.

The Final EIS/EIR for the AAC Lining Project was filed with EPA on April 14, 1994 and noticed in the *Federal Register* on April 19, 1994. A ROD was prepared and signed by the Lower Colorado Region's Regional Director on July 29, 1994. On January 12, 2006 Reclamation determined that the EIS and ROD continued to meet the requirements of NEPA. Funding for the AAC Lining Project was authorized by the California legislature in September 2003. Final designs for the AAC Lining Project were completed in January 2006 (Reclamation 2006) and construction began in Summer 2007.

5.2.6 Long-Term Experimental Plan for the Operation of Glen Canyon Dam and Other Associated Management Activities

The Upper Colorado Region of Reclamation has filed a NOI to prepare an EIS regarding experimental actions to benefit resources downstream of Glen Canyon Dam in the GCNRA and Grand Canyon National Park (71 Fed. Reg. 74556). The purpose of this Long-Term Experimental Plan is to increase understanding of the ecosystem downstream of Glen Canyon Dam and to improve and protect important downstream resources. The NEPA process would analyze the implications and impacts of each of the alternatives on all of the purposes and benefits of Glen Canyon Dam as well as on downstream resources. The Long-Term Experimental Plan would implement a structured, long-term program of experimentation (including dam operations, modifications to Glen Canyon Dam intake structures, and other non-flow management actions, such as removal of non-native fish species) and monitoring in Colorado River downstream of Glen Canyon Dam.

The Long-Term Experimental Plan is intended to ensure a continued, structured application of adaptive management in such a manner as to protect, mitigate adverse impacts to, and improve the values for which Grand Canyon National Park and GCNRA were established, including, but not limited to, natural and cultural resources and visitor use, consistent with applicable federal law.

The Long-Term Experimental Plan will build on a decade of scientific experimentation and monitoring that has taken place as part of the Glen Canyon Dam Adaptive Management Program, and will build on the knowledge gained by experiments, operations, and management actions taken under that program. Accordingly, Reclamation intends to tier from earlier NEPA compliance documents prepared as part of the Department's Glen Canyon Adaptive Management Program efforts (40 C.F.R. pt. 1500.4(i), 1502.20, and 1508.20(b)), such as the 2002 EA prepared on adaptive management experimental actions at Glen Canyon Dam (Reclamation 2002).

The anticipated implementation of a Long-Term Experimental Plan for the operation of Glen Canyon Dam is not anticipated to contribute to cumulative adverse effects to the resources described below.

5.2.7 Cumulative Impacts by Resource

5.2.7.1 Hydrologic Resources and Water Delivery

Water from SNWA Clark, Lincoln, and White Pine Counties groundwater development projects will be fully consumptively used in southern Nevada and will increase return flows to Lake Mead. This increase was modeled as part of the hydrologic analysis in this Final EIS. Similarly, water conserved under the AAC lining project, and planned changes in point of delivery (a covered action under the LCR MSCP), were also accounted for in the hydrologic modeling for this Final EIS. The SCOP and SNWA Lake Mead Intake No. 3 project would not result in any cumulative effects because these projects would not alter water system operations. The Long-Term Experimental Plan would implement a structured, long-term program of experimentation (including dam operations, modifications to Glen Canyon Dam intake structures, and other non-flow management actions such as removal of non-native fish species) and monitoring in Colorado River downstream of Glen Canyon Dam. It is not expected to result in cumulative adverse impacts to hydrologic resources or water delivery.

5.2.7.2 Water Quality

For the reasons described immediately above, the potential cumulative impacts on water quality from SNWA groundwater development projects, AAC lining project, and planned changes in point of delivery were included in the modeling assumptions, and are included in the analyses presented in Section 4.5 of this Final EIS. The Long-Term Experimental Plan for Glen Canyon Dam could result in some alteration of water quality parameters, particularly temperature, in the Colorado River reach between Glen Canyon Dam and Lake Mead. Because the outcome of the planning process is not known, it would be speculative to address potential cumulative effects at this time.

The SCOP has the potential to affect water quality in Lake Mead. However, the SCOP is intended to accommodate Lake Mead's lowering elevations since the amount of mixing and dilution available in the inner Las Vegas Bay would decrease as Lake Mead elevations decrease. The SCOP also intends to provide flexibility to avoid possible impacts to source-water quality at SNWA's intake structure. As a result of these project planning criteria, no significant cumulative impacts are anticipated.

5.2.7.3 Air Quality

Changed operations due to the AAC lining project and changed points of diversion envisioned under the LCR MSCP have the potential to change storage elevations and exposed shoreline at Lake Mead. Potential effects from these operations were taken into account in the modeling performed for this EIS, and potential impacts of wind-blown dust from exposed reservoir shoreline is already included in the analyses presented in Section 4.6. The slight increase in return flow credits from the northern Nevada groundwater projects would have no cumulative effect on air quality. The LCR MSCP may result in minor reductions in fugitive dust emissions through the creation of habitat

on lands that currently may be less vegetated and therefore potentially produce more fugitive dust.

5.2.7.4 Visual Resources

Potential cumulative impacts related to the exposure of the calcium carbonate ring around Lake Mead was included in the modeling for this EIS, as described above.

Implementation of the LCR MSCP will result in the creation of new habitat areas, which viewers may perceive as attractive. The proposed federal action would not affect the creation of this habitat.

5.2.7.5 Biological Resources

As noted above, the potential cumulative impacts on Lake Mead storage and releases from the increased return flows from SNWA groundwater development projects, AAC lining project, and other planned changes in point of diversion were accounted for in the hydrologic modeling for this Final EIS and are reflected in the biological impact analysis presented in Section 4.8. The LCR MSCP will result in substantial habitat creation along the lower Colorado River. This habitat creation will provide benefits to biological resources. No adverse cumulative effects to biological resources are anticipated from the SCOP or SNWA Lake Mead Intake No. 3 project. The Long-Term Experimental Plan has the potential to affect biological resources in the reach of the Colorado River between Lake Powell and Lake Mead, especially from potential flow and non-flow actions and temperature changes. It would be speculative to address potential cumulative effects associated with the ongoing Long-Term Experimental Plan process at this time because the outcome of the planning process is not known.

5.2.7.6 Cultural Resources

The proposed federal action's effects on cultural resources result from hydrologic changes in reservoir elevations and river flows. Projects with potential for cumulative impacts were included in the hydrologic modeling; such as, cumulative impacts on cultural resources are already addressed in Section 4.9. The conservation projects to be implemented under the LCR MSCP have the potential to impact cultural resources through construction activities, as do the AAC lining, SCOP, and SNWA Lake Mead Intake No. 3 projects. Each of these projects will comply with Section 106 of the NHPA; significant adverse cumulative impacts are not anticipated.

5.2.7.7 Indian Trust Assets

The proposed federal action would not result in any substantive effects on ITAs. Therefore, it would not contribute to any cumulative effects.

5.2.7.8 Electrical Power

Effects on electrical power production related to the proposed federal action are described in Section 4.11. The hydrologic effects of the related projects discussed above were included in the modeling assumptions, have been included in the analyses. The SNWA Lake Mead Intake No. 3 project and SCOP would not have cumulative impacts related to electrical power production. The Long-Term Experimental Plan has the potential to affect power production at Glen Canyon Dam. It would be speculative to address potential cumulative effects associated with the ongoing Long-Term Experimental Plan process at this time because the outcome of the planning process is not known.

5.2.7.9 Recreation

Effects on recreation activities related to the proposed federal action are described in Section 4.12. To the extent these recreation impacts are dependent on reservoir elevations, the effects of the projects listed above are included in the analyses. The LCR MSCP, SCOP, SNWA Lake Mead Intake No. 3, and AAC lining projects would not contribute to any cumulative effects on recreation. The Long-Term Experimental Plan for Glen Canyon Dam could result in some alteration of flow and water quality parameters, particularly temperature, in the Colorado River reach between Glen Canyon Dam and Lake Mead. This could result in recreational fishing and boating impacts. It would be speculative to address potential cumulative effects associated with the ongoing Long-Term Experimental Plan process at this time because the outcome of the planning process is not known.

5.2.7.10 Transportation

Effects on transportation related to the proposed federal action are described in Section 4.13. To the extent these transportation impacts are dependent on reservoir elevations, the effects of the projects listed above are included in the analyses. The LCR MSCP, SCOP, SNWA Lake Mead Intake No. 3 project, and the Long-Term Experimental Plan would not contribute to any cumulative effects on transportation. The AAC lining project would have temporary and localized impacts on transportation during construction. These impacts would be at a significant distance from the Colorado River corridor, and no cumulative impacts are anticipated.

5.2.7.11 Socioeconomics

Effects on socioeconomics related to the proposed federal action are described in Section 4.14, and occur in the service areas of Colorado River water users, primarily in Arizona. The projects listed above would not contribute to any cumulative effects on socioeconomic conditions. The AAC lining, SCOP, SNWA Lake Mead Intake No. 3, and implementation of the LCR MSCP conservation projects will result in short-term economic benefits from creation of jobs for these construction projects. However, these temporary effects would not contribute to any cumulative effects associated with the proposed federal action.

5.2.7.12 Environmental Justice

The proposed federal action would not result in any substantive effects on environmental justice communities. Therefore, it would not contribute to any cumulative effects.

5.3 Relationship Between Short-term Uses of the Environment and Long-term Productivity

For purposes of this required regulatory assessment, Reclamation considers the interim period of the proposed federal action (through 2026) short-term, especially when compared with the longer modeling period of through 2060 or even longer durations. Within this time-frame, Reclamation would implement water management practices that would result in an increased predictability of water operations, particularly under drought and low reservoir conditions. This predictability is expected to have a stabilizing effect on the use of water in the region by ensuring that all parties have a better understanding of how the system would operate and, therefore, what management actions water users may need to undertake under such conditions, thus ensuring long-term productivity.

The trade-off between short-term uses of the environment and long-term productivity is such that Reclamation, and state and local water managers and users will gain valuable experience operating under shortage conditions, thus ultimately resulting in enhanced long-term productivity throughout the region. Adoption of the proposed federal action would contribute to the long-term predictability of water use through highly defined water operations.

5.4 Irreversible and Irretrievable Commitments of Resources

Irreversible commitments are decisions impacting non-renewable resources such as soils, wetlands, and waterfowl habitat or commitments that cannot be reversed. Such decisions are considered irreversible because their implementation would impact a resource to the point that renewal can occur only over an extremely long period of time or at great expense or because they would cause the resource to be destroyed, become extinct, or removed. The term “irreversible” describes the loss of future options and applies to the impacts of using nonrenewable resources or resources that are renewable only over a long period of time. Irretrievable commitments are those that are lost for a period of time.

Implementation of the proposed federal action would not result in irreversible or irretrievable commitment of resources. Managing water supplies in a more structured way will help conserve resources. In addition, the proposed guidelines are intentionally interim in order to provide opportunities for gaining valuable operation experience under a wide range of reservoir conditions.